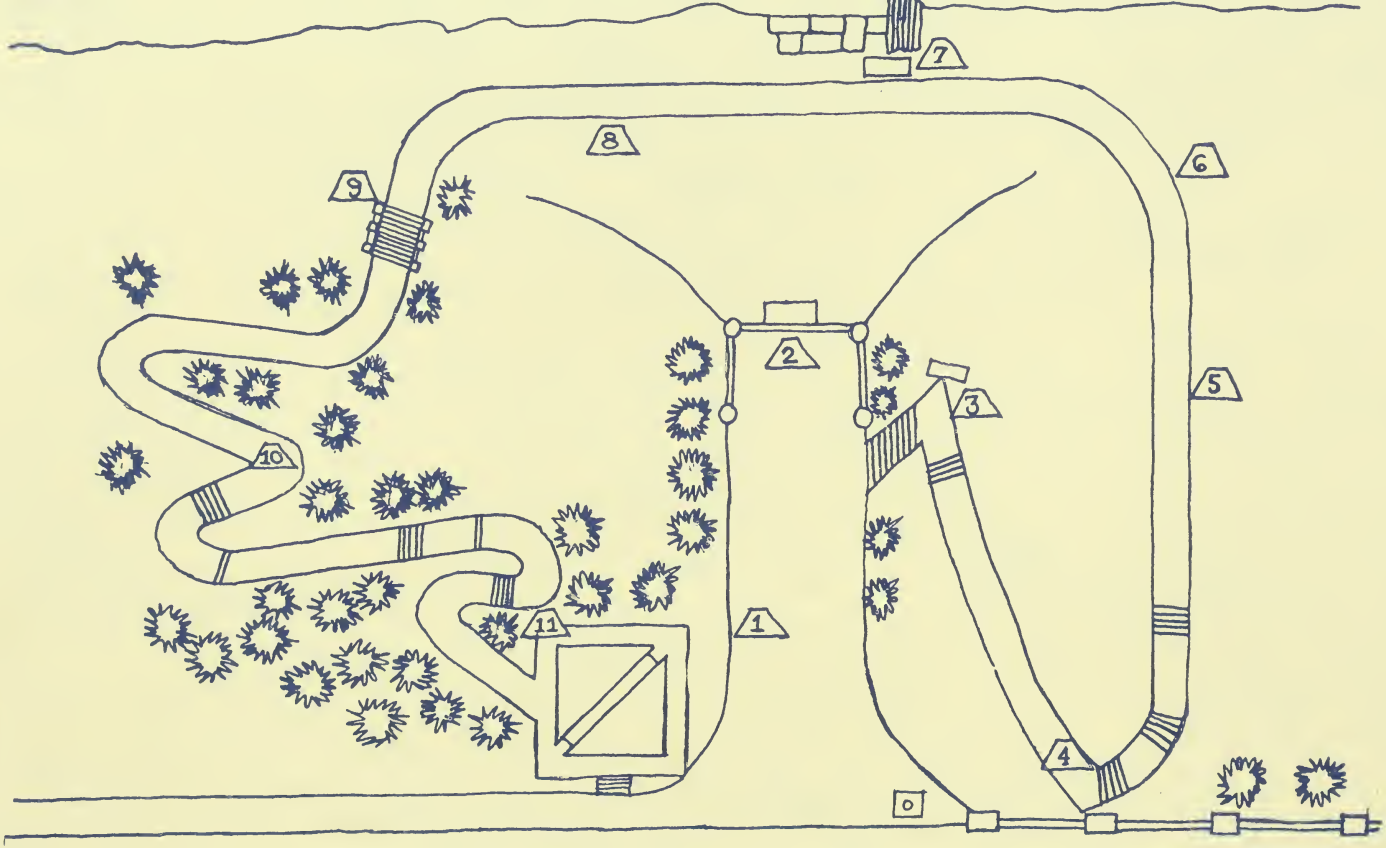
I 29.2
Ab 9

South Abutment Trail

UNIVERSITY OF GEORGIA
JUN 28 1985
LIBRARIES
DEPOSITORY


7
8
6
9
2
5
3
10
1
11
4
0

Introduction

Welcome to Johnstown Flood National Memorial and the South Abutment Trail. You will be walking on and around the remains of South Fork Dam, preserved by the National Park Service.

Originally constructed by the state of Pennsylvania between 1838 and 1852, the dam served as a reservoir on the Main Line Canal System. Its purpose was to provide water for the canal basin in Johnstown during the dry summer months. With the advent of railroads, the canal system went out of business and slowly faded into obscurity. The reservoir was virtually abandoned, and in 1862, a serious break occurred, leaving behind nothing more than an oversized pond.

It wasn't until 1879 that a group of wealthy Pittsburgh industrialists proposed to repair the dam and convert the old reservoir into a resort lake. But the members of the South Fork Fishing and Hunting Club of Pittsburgh, as it was chartered, had only a few years to enjoy their mountain retreat. In late May of 1889, rains swelled area streams and filled the lake beyond its capacity, precipitating one of history's major "natural" disasters -- the Great Johnstown Flood of 1889.

On May 31, 1889, at approximately 3:00 P.M., South Fork Dam collapsed releasing a 30-to-40-foot high wall of water. Within an hour, this wave had ravaged the valley of the Conemaugh and the city of Johnstown, leaving in its wake 2,209 people dead and millions of dollars worth of damage.

Subsequent investigations into the possible causes of the disaster revealed that shortcuts taken in repairing the dam coupled with improvements made to accommodate club

members may have contributed to the dam's failure. This raised questions such as: Why did the dam break? Could such a tragedy have been prevented? Who or what was responsible? As you continue along the trail, see if you can answer these questions while you view the remains of the dam.

The numbered stakes you will see along the trail correspond with the numbered paragraphs in this booklet. To enjoy the trail fully, we suggest you start at Station #1.

We ask that you help us to preserve the area. Please do not litter, destroy or remove any objects.

1. You are standing on what used to be a road to the clubhouse and cottages. This road stretched the entire 931 feet across the top of the dam. Club members and their guests would often stop their carriages on the dam to take in the view of their beautiful "Lake Conemaugh," as they had renamed the old reservoir. Originally, the top of the dam was only 10 feet wide. In order to provide sufficient room for member's carriages to pass one another, the height of the dam was lowered two feet, to where the dam wall was 20 feet wide.

2. This is the south abutment of the dam. It is approximately 420 feet from here to the north abutment. When this earthen dam was washed out, the breach measured 420 feet at the top. No water should ever go over the mid-point of an earthen dam. Accordingly, the dam must be highest and strongest at its center, but after South Fork Dam was renovated, settling materials caused a slight sag in the middle. This left the top of the breast at that point only 4½ feet higher than the bottom of the spillway, a channel which carried off excess water in case of reservoir overflow. So, when water started over the top of the dam, the pressure was greatest in the worst possible spot - the center.

In 1891, the railroad tracks you see at the base of the north abutment were laid through the lake bed to be used as a spur line to haul coal from mines south of here to the Main Line of the Pennsylvania Railroad. This effectively insured that the South Fork Dam would not be rebuilt.

3. Here you are at the approximate 1889 level of the lake. You will notice it is only about five feet to the top of the dam. While the state owned the reservoir, the water was kept at a level of 50 feet. The South Fork Fishing and Hunting Club kept it at a 65-foot depth. The lowered breast and the slightly sagging middle did not allow for raising the lake's water level.

4. As you look north across the stream to the opposite hillside, you can see

the bare rock face of the side of the spillway. Cut out of solid rock, it was originally 99 feet wide and 10 feet deep. Near the waterfall at the foot of the spillway was a favorite picnic spot for the club members.

A heavy, timber bridge was constructed over the spillway. Wire screens fastened to this bridge prevented fish from escaping from the lake. On May 31, 1889, these screens became hopelessly clogged with debris, closing off the only means of releasing water from the lake, and forcing water over the top of the dam. The dam was eventually washed out.

5. You are now at the bottom of Lake Conemaugh. Once under as much as 65 feet of water, the lake bed has slowly been reclaimed by the forest and field plants you see today.

Back in the 1880's, to ensure good fishing, members of the club had the lake stocked with fish, transporting them by special railroad car from as far away as Lake Erie. The cost? A dollar per fish, an unheard of amount at a time when the average worker earned ten dollars a week!

6. Before you is the South Fork of the Little Conemaugh River. The river was named "Cough-Naugh-Maugh" by the Deleware Indians and means "little otter" or "otter river." In the 1880's it was a clear, cold mountain stream noted for its great trout fishing. Thus, it served as an excellent feeder stream for Lake Conemaugh.

Once dammed up, it provided the club with a body of water almost three miles long and, in places, a mile wide. It was ideally suited for the members' sailboats and steamboats.

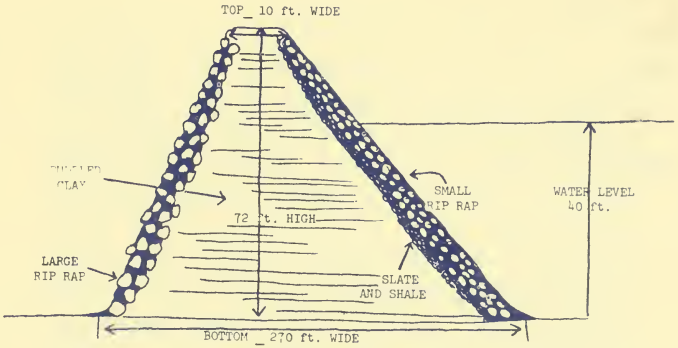
Sulfurous drainage from area coal mines destroyed the original qualities of the stream and has given it the orange color which it has today.

7. The original dam had a control mechanism consisting of a sluice gate with pipes covered by a stone culvert extending 270 feet through the base of the embankment. A valve tower inside the reservoir regulated the discharge through five 24-inch pipes.

After the 1862 break, these pipes were sold for scrap. Later the control tower burned down. Loss of this vital control system, never replaced by the club, left no practical means of regulating the amount of water in the lake. The foundation stones you see are all that remains of the culvert following the 1889 break.

8. From here you can see the shape of the earthen dam. Note that the outer wall on the downstream side has a steeper slope than the inner one. The original wall of the reservoir is all that remains today. It contained a core of well packed wet clay supported on both sides by stone and gravel.

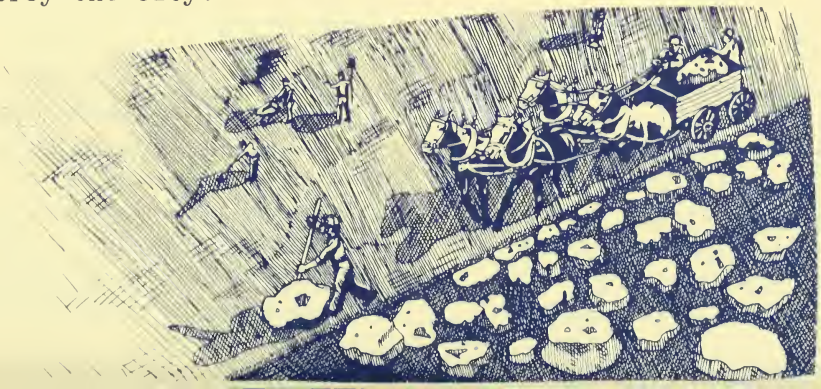
Instead of following established engineering procedures for repairing the 1862 break, the club simply boarded up the culvert and filled in the breach with stone, gravel, mud, brush, hemlock boughs, hay and even horse manure!! The repairs made by the club, together with parts of the original construction were carried off by the flood waters.



9. A force of 20 million tons of water roared down the Conemaugh Valley from here, attaining speeds of up to 40 miles per hour. Look downriver and imagine the unleashing of the destructive force which shaved wooden hillsides down to bare rock, snapped hugh trees like toothpicks, moved 80-ton steam locomotives about like childrens' toys, and lifted houses from their foundations tossing them about before crushing them.

It took the water about an hour to travel the 14 miles of river channel to Johnstown, and only 10 minutes to virtually destroy the city.

10. The large stones you see piled upon the face of the dam give strength and support to the dam and are called rip-rap. They are part of the original dam, in its time one of the largest earthen dams in the world. The layer of rip-rap is 20 feet thick at the base and 4 feet thick at the top. Some of the stones were so heavy that it took three teams of horses to move them into place. But even the strength of these large stones together with clay and slate was no match for the pressure of the water.



11. The Dam in Retrospect

Was the South Fork Fishing and Hunting Club alone responsible for the breaking of the South Fork Dam? The feeling prevalent in 1889 following the tragedy was the club members were indeed responsible and should be held accountable for their actions. After all, their shoddy repair methods certainly rendered the dam incapable of holding back such a tremendous amount of water. The discharge pipes had not been replaced, the spillway had been obstructed by their fish screens, the old break had been filled in with whatever material they cound find, and no one with any engineering knowledge had supervised the repairs. Had the job been done properly, would not the dam have held and the people of Johnstown been spared?

The question of who was to blame was never satisfactorily answered, and may never be. One engineering study made on the dam after the flood concluded that even had the dam been properly repaired with the discharge pipes open and the spillway open to full flow, the unprecedented amount of rainfall from the May 30-31 storm was more than the earthen structure could have contained. Then, too, the people who lived in the Conemaugh Valley had, for years, tampered drastically with nature with no regard for the consequences of their actions. To supply lumber for homes and businesses they cut down protective timber from the hillsides -- trees whose roots soaked up heavy rains, preventing flash runoffs. River channels were obstructed or diminished for industrial expansion thereby reducing the river's capacity to handle large volumes of water without overflowing its banks.

It is difficult then, to assign blame. We can only hope to learn from others' mistakes, and profit from them by developing a more responsible attitude toward our fellow man and our environment.

This is the last stop on South Abutment Trail. We hope you have enjoyed your

brief walk into history. If you have not already done so, we invite you to stop at the Visitor Center. If you have any questions the ranger will be happy to answer them. If you do not wish to keep this booklet, please place it in the box nearby.

UNIVERSITY OF GEORGIA LIBRARIES
South abutment trail.
I 29.2:Ab 9
3 2108 04969 3669

NOTES

JOHNSTOWN FLOOD NATIONAL MEMORIAL

STATEMENT OF PURPOSE

Johnstown Flood National Memorial was created by an Act of Congress in 1964, and is administered by the National Park Service, a bureau of the United States Department of Interior.

The purpose of the Johnstown Flood National Memorial is to:

Commemorate the Johnstown Flood of May 31, 1889, by preserving the remnants of the South Fork Dam;

Interpret the cause and effect of the disaster upon the region and its people, including the humanitarian outpouring of aid and of man's dependence upon natural laws;

Preserve a landmark of America's heritage for future generations to enjoy;

Communicate to visitors a understanding of Johnstown Flood's contribution to the shaping of our nation;

Manage the park and its facilities for maximum visitor enjoyment consistant with its character and unique value;

Cooperate in the historic preservation movement with state and local governments, private organizations, and individuals.